
Space Weather Forecast

Issued on Sunday, 14 July 2024 at 01:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Further Moderate Class flares expected (R1-R2 Blackouts)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: High with seven Moderate class flares. The majority of these, including two that reached the R2 Blackout level, are from the largest and most active of the ten regions currently on the Earth-facing disc. While a largely open region, it has a number of dark sunspot cores, including two large positive leader spots. The region also developed a weak but magnetically complex region to the northwest of its main leader spot. Three further sunspot regions, all in the eastern disc, while smaller and relatively simple also saw some emergence of further spots. A further three regions also rotated onto the southeast disc through this period.

Despite the number of solar flares, no Earth-directed coronal mass ejections (CMEs) have been observed. However one of the larger flares, which occurred at 13/2301 UTC, has the potential to have produced a CME. This will be assessed once further imagery is available.

Solar Wind / Geomagnetic Activity: Slow wind conditions dominated the solar wind environment. Observed speeds at persisted at background 300-350 km/s. Total Interplanetary Magnetic Field was weak with the north-south component weak and variable. Geomagnetic activity was Quiet (Kp 1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) persisted at Background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate-class flares remain Likely, with large sunspot region in the southeast the most probable source. No significant regions are due to depart or arrive through the period - keeping a flat risk throughout.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Initial slow wind conditions are expected to be followed by a slight enhancement due to the onset of the fast winds from a coronal hole on day 1 (14 Jul). Any enhancement then easing day 2 (15 Jul) onward. Mainly Quiet geomagnetic activity expected, with isolated Unsettled intervals. And fast wind enhancement on day 1 (14 Jul) will bring a likelihood of an Unsettled to Active spell and a slight chance of G1 Minor Storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has a chance of rising in response to any notable flares, primarily from the large sunspot on the disc. This would typically bring a slight chance of reaching the S1 Minor Storm threshold. However, the larger solar flare at 13/2301 UTC brings a slightly enhanced chance of this occurring day 1-2 (14-15 Jul).

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	30	5	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	80	75	70	60
Very Active	R3 to R5 X	No	20	20	15	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	25	20	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)